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| LIGHTFOOT, ELENA TSOY | |
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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 10/501,225
Filing Date: February 04, 2005
Appellant(s): LINDEN ET AL.

Silvia Salvadori
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed March 15, 2011 appealing from the Office action mailed June 16, 2010.

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

Claims 1, 3-5, 8-10, 12, 17-22 and 34-35 are currently rejected and are presented on appeal.

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS."

New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

Claims 1, 3-5, 8-10, 12, 17-22 and 34-35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al '927 in view of Saito et al (US 5021114), further in view of Otto et al (US 5,643,638).

**(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 5,024,927 | YAMADA ET AL | 6-1991 |
| 5,021,114 | SAITO ET AL | 6-1991 |
| 5,643,638 | OTTO ET AL | 7-1997 |
| 6,465,057 | NAKAHIGASHI ET AL | 10-2002 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3-5, 8-10, 12, 17-22 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al '927 in view of Saito et al (US 5021114), further in view of Otto et al (US 5,643,638).

The presently claimed invention is directed to a method for applying a hybrid coating to a substrate, wherein the coating comprises an organic and an inorganic component whose precursors

are activated in two or more plasma sources for pulsed plasma activated deposition of a chemical vapor phase. The activated precursors are combined before being deposited on the substrate. (e.g., page 2, lines 13-27, page 6, lines 15-22, page 10, lines 15-16 and page 14, lines 18-20).

Yamada et al discloses a method for producing an information recording medium on a substrate such as polycarbonate (See column 12, line 37), the method comprising depositing on the substrate a recording layer which comprises (a) a carbon-based material and (b) an optically reversible material (See column 4, lines 50-57) of inorganic material (See column 5, lines 52-59) using plasma CVD (See column 9, lines 62-67) while maintaining the temperature of the substrate in the range of 20°C -200°C (See column 10, lines 32-35); and then depositing on the recording layer, a heat-radiation layer made of a carbon-based material (claimed organic component) in which finely-divided metallic particles having particle size of 50 nm or less, preferably 30 nm or less (claimed inorganic component comprising nanoparticles) (See column 11, lines 48-50) are dispersed (See column 11, lines 16-20). Thus, the heat-radiation layer is claimed hybrid coating.

Note that claim 1 is open-ended and thus, does not exclude other coatings such as a recording layer in addition to claimed hybrid coating (i.e. in addition to the heat-radiation layer).

As to claimed limitation of activating the organic and inorganic component in two or more separate plasma sources, Yamada et al teaches that the heat-radiation layer of the carbon-based material in which finely-divided metallic particles are dispersed can be formed any one of the known methods such as co-vapor deposition, a combination of plasma CVD of an organic material and vapor deposition of a metal, plasma CVD of an organometallic composite material (organometallic compound, organometallic complex, metallic alkoxide), and plasma CVD of an organic material and halogenated metallic compound (See column 11, lines 36-45).

Yamada et al fails to teach that the precursors for organic and inorganic component are activated in two or more separate plasma sources (Claim 1).

**Saito et al** teaches that when two different gas precursors, e.g. a gas difficult to activate and a gas easy to activate, are used for depositing a coating film, activating the gases independently of each other using separate plasma sources as shown in FIG. 13 (See column 16, lines 67-68), wherein the gas difficult to activate is pre-activated in an activating chamber 31 by microwave-ionized plasma of **high** (electron) **density** (See column 14, lines 53-62)at the frequency of 2.45 GHz (See column 17, lines 19-21), i.e. at the **high frequency** as described at page 12, lines 26-29 of the Appellants' specification (claimed high electron density high-frequency plasma) prior to introducing it into a reaction chamber 1a containing a substrate 5 to be coated (See Fig. 13), and the gas easy to activate is activated above the substrate 5 in the reaction chamber 1a by a high-frequency plasma of a **low** (electron) **level** (claimed low electron density high-frequency plasma) (See column 15, lines 39-47), allows to form the film of high quality uniformly at an increased speed (See column 6, line 63 to column 7, line 10; column 16, line 67 to column 17, line 3) since there is no need for application of high power for increasing the density of plasma produced above the substrate such that situation in which concentration only of the activated gas which is easy to activate is increased can be evaded, whereby the reaction at a rate approximating to the stoichiometrical rate is increased, and thus, the formation of film is accomplished at a high speed without involving deterioration in the film quality (See column 15, lines 45-54). Thus, the low level plasma in the reaction chamber is used to activate the gas easy to activate and to further activate pre-activated gas.

Obviously, the precursors of an organic material, organometallic compound and halogenated metallic compound in Yamada et al will require plasmas of different power levels for plasma deposition depending on their particular chemical structures. It is the Examiner's position that difficult to activate precursor may include a precursor for either organic or inorganic component depending on particular structures.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out plasma chemical co-vapor deposition of the hybrid heat-radiation layer in Yamada et al from an organic component and inorganic component precursors by pre-activating the difficult to active precursor in a separate activating chamber with high electron density high-frequency plasma and introducing the pre-activated precursor together with a precursor that is easy to activate into a reaction chamber containing a substrate to be coated with the expectation of depositing a coating film of high quality uniformly at an increased speed, as taught by Saito et al, since Yamada et al does not limit its teaching to particular co-vapor deposition methods.

As to claimed limitation of combining activated precursors before depositing on the substrate, Saito et al further teaches that a flat plate is provided at the boundary between the activating chamber 31 and the reaction chamber 1a to ensure uniform supply of both gases to the substrate 5 (See Fig. 13). The plate is provided with a plurality of holes 34 alternately with holes 35 (as shown in Fig. 14) for introducing easy to activate gas into the reaction chamber 1a (holes 34) and to introduce into the reaction chamber 1a the pre-activated gas from the activating chamber 31 (holes 35). (See column 16, lines 15-30). Obviously, the easy to activate gas flowing from the holes 34 and the pre-activated gas flowing from the holes 35 form a **mixture** in the

reaction chamber 1a before depositing on the substrate since the holes 34 and 35 are alternately distributed in the flat plate, and since gases expand to fill any volume due to their very nature of being a gas. Thus, it is reasonable to assume that both activated precursor gases are combined before depositing on the substrate, as required by Claim 1.

As to pulsed plasma, Yamada et al further teaches that the temperature of the substrate such as polycarbonate (i.e. of a synthetic thermoplastic resin) (See column 12, line 37) is maintained in the range from $0^0$C to $350^0$C, preferably from **$20^0$C** to $200^0$C (See column 10, lines 33-35) during plasma deposition of the recording layer (See column 10, lines 22-28) having 20-500 nm thickness (See column 10, lines 53-55). Obviously, the substrate should be maintained in the range from **$20^0$C** to $200^0$C during the plasma deposition of the heat-radiation layer since 20 nm – 500 nm thick recording layer would not be capable of protecting the resin substrate from the heat.

Yamada et al in view of Saito et al fails to teach the use of pulsed plasma (Claim 1).

**Otto et al** is applied here for the description of plasma pulse CVD methods **known in the art** (i.e. not for the description of Otto's own invention), for example, a method described in the article of Kersten et al entitled "Thick Coatings of Doped Synthetic Silica Glass by Plasma Impulse CVD" published in the journal of the Ceramic Society of Japan 99 (10), pages 894 to 902 (**1991**). In these (known) methods, the electromagnetic radiation which excites the plasma is supplied in a pulsed manner for continuous flow of the coating gases. With each pulse, a thin layer (typically approximately 1 nm) is deposited on the substrate. Even substrates which are not stable to temperature can be deposited during a pulse of high power because a pulse interval follows each power pulse. In this way, especially high coating rates are possible without significant temperature

loading of the substrate. See column 2, lines 44-58. Thus, Otto describes the use of pulsed plasma to avoid damage of heat-sensitive substrates during plasma deposition without limiting heat-sensitive substrates or coatings.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pulsed plasma for depositing any coating on any heat-sensitive substrate, including plasma deposition of hybrid coating on a heat-sensitive polycarbonate substrate of Yamada with the expectation of providing the desired high coating rates without significant temperature loading of the substrate, as taught by Otto et al.

As to claims 3-5, 21-22, Saito et al teaches that difficult to activate precursor is activated by high (electron) density high-frequency plasma in a chamber 31, and easy to activate precursor is activated by low (electron) density high-frequency plasma in the chamber 1a close to the substrate such that the pre-activated difficult to activate precursor passes the plasma of low level for activation of the easy to activate precursor (See Fig. 13, column 14, line 34 to column 15, line 7). It is the Examiner's position that difficult to activate precursor may include a precursor for either organic or inorganic component depending on particular structures.

As to claim 8, Saito et al teaches that the easy to activate reactant may be activated by high-frequency low (electron) density plasma (See column 15, lines 39-58).

As to claims 10, 12, 17, Yamada et al teaches that the organic matrix and finely-divided metallic particles may be prepared from an organic material and/or organic metallic compound as a precursor for inorganic component and as a precursor for organic component (See column 11, lines 40-45). Examples of such an organic metallic compound include organoaluminum compounds such as trimethyl aluminum, triethyl aluminum and triisobutyl aluminum,

organosilane compounds such as tetramethyl silane, tetraethyl silane, tetrapropyl silane and tetrabutyl silane, organotin compounds such as tetramethyl tin, tetraethyl tin, tetrapropyl tin and tetrabutyl tin and organozinc compounds such as dimethyl zinc and diethyl zinc (See column 6, line 48 to column 7, line 14). In addition, halogenated organometallic compounds can also be employed, which are prepared by substituting some or all hydrogen atoms of the above-described organometallic compounds with halogen atoms such as fluorine atoms, chlorine atoms, bromine atoms or iodine atoms (See column 7, lines 15-21).

As to claims 18-19, Yamada et al teaches that reaction pressure is 0.001 to 10 Torr (mbar), preferably 0.003 to 2 Torr (mbar) (See column 7, lines 34-35). Saito et al teaches that the microwave plasma in the activating chamber 31 is stable even in low vacuum range of less than 1 Torr (mbar) (See column 17, lines 10-11).

As to claim 20, Yamada et al teaches that the plasmas are formed by bringing a mixture of precursor material, argon gas and optionally oxygen (See column 6, lines 34-36) to electrical discharge (See column 7, lines 21-26).

As to claims 34-35, Otto et al teaches that in a plasma pulse CVD method, a change of the power, which is supplied for generating and maintaining the plasma, is not decisive for producing a deposition layer. This is in contrast to the state of the art for continuous methods. Instead, the amplitude and duration of the power pulse as well as the duration of the pulse interval are decisive for the production of a coating layer. The mean power can be adjusted in a simple manner for a plasma pulse CVD method via the length of the pulse interval and/or pulse width and/or the magnitude of the pulse amplitude. (See column 2, line 59 to column 3, line 59). By using the plasma pulse CVD method, elementary layers (single layers) of different composition can be

deposited (See column 3, lines 27-29). The plasma pulse CVD method can be carried out with alternating current voltage pulses having a frequency between approximately 50 kHz and 300 GHz (See column 5, lines 61-63).

In other words, amplitude and duration of the power pulse as well as duration of the pulse interval (i.e. including duty cycle which is ratio of the pulse duration to the pulse interval) are result-effective parameters in pulsed CVD process. It is held that it is not inventive to discover the optimum or workable ranges of result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Moreover, it is, in general, a matter of prima facie obviousness for one of ordinary skill in the art to determine the optimum process conditions, contingent upon the desired product.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant pulse frequency and a duty cycle parameters (including those of claimed invention) in Yamada et al in view of Otto et al through routine experimentation depending on particular application in the absence of showing of criticality.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6465057 to **Nakahigashi et al** was discussed by the Examiner in the Advisory Action mailed on 9/29/2010 to show that it was known in the art that pulsed plasma assisted CVD (See column 4, lines 35-43; column 12, lines 7-17) allowed to conduct coating heat-sensitive substrates

such as organic thermosetting resin, thermoplastic resin, rubber, paper, wood or the like (See column 7, lines 1-5) at low temperature such as **$25^0$C** (See column 14, line 58).

**(10) Response to Argument**

Appellants submit that Yamada does not disclose Appellants' invention since Yamada only provides for an information recording medium comprising a substrate and a recording layer formed thereon which comprises a carbon-based material and an optically reversible material (e.g., col. 4, lines 50-57). The film of optically reversible material must be prepared under specific conditions to be capable to reversibly turn from an amorphous phase to a crystalline phase and vice versa (e.g., col. 5, lines 52-55 and col. 6, lines 20-27).

The Examiner respectfully disagrees with this argument. First of all, in contrast to Appellants' assertion, Yamada provides for an information recording medium comprising a substrate, a recording layer formed thereon which comprises a carbon-based material and an optically reversible material (e.g., col. 4, lines 50-57), and a heat-radiation layer on the recording layer, the heat-radiation layer made of a carbon-based material (claimed organic component) in which finely-divided metallic particles having particle size of 50 nm or less, preferably 30 nm or less (claimed inorganic component comprising nanoparticles) (See column 11, lines 48-50) are dispersed (claimed hybrid coating) (See column 11, lines 16-20). Appellants' invention as claimed in Claim 1 is directed to a method of applying a hybrid coating to a substrate without limiting a substrate or hybrid coating, or claim 1 does not recite a negative limitation excluding an information recording medium and a recording layer formed thereon which comprises a carbon-based material and an optically reversible material. Therefore, claimed method does not exclude an information recording medium as a hybrid coated substrate, and does not exclude a step of applying to the substrate a recording layer comprising a carbon-based material and an optically

reversible material prior to applying claimed hybrid (heat-radiation) layer. Thus, a method of Yamada of applying a heat-radiation layer comprising metallic nanoparticles (claimed inorganic component comprising nanoparticles) dispersed in a carbon-based material (claimed organic component) to a recording layer on a substrate reads on claimed "method of applying a hybrid coating to a substrate".

Therefore, Appellants's discussion of optically reversible material being prepared under specific conditions to be capable to reversibly turn from an amorphous phase to a crystalline phase and vice versa is completely irrelevant to the question of patentability of the claimed invention over Yamada.

Appellants submit that Yamada is completely silent with regard to inorganic and organic components being activated and combined before being deposited on the substrate. Saito also does not disclose Appellants' invention nor does it provide for Yamada's missing link. Saito describes a method and an apparatus capable of forming a film of high quality uniformly on a substrate without damaging the substrate (e.g., col. 2, lines 61-65).

The Examiner respectfully disagrees with this argument. A secondary reference of Saito is cited by the Examiner to show that when two different gas precursors, e.g. a gas difficult to activate and a gas easy to activate, are used for depositing a coating film, activating the gases independently of each other using separate plasma sources such that the gas difficult to activate is pre-activated in an activating chamber by **high (electron) density** high frequency**,** and then introduced it together with the gas easy to activate to a zone of **low (electron) density** high-frequency plasma in a reaction chamber, results in forming a film of high quality uniformly at an increased speed.

Therefore, one of ordinary skill in the art would have had clear motivation in activating organic component precursors and inorganic component precursors independently of each other using separate plasma sources such that the precursor difficult to activate is pre-activated in an activating chamber by high (electron) density high frequency, and then introduced it together with the precursor easy to activate to a zone of low (electron) density high-frequency plasma in a reaction chamber in order to form a film of high quality uniformly at an increased speed, as taught by Saito.

Furthermore, one of ordinary skill in the art would have reasonable expectation of success in modifying Yamada with Saito since Yamada does not limit its teaching to particular co-deposition techniques.

Appellants submit that Saito, as Yamada, is also completely silent with regard to pulsed plasma and with regard to organic and inorganic precursors being activated and combined before being deposited on a substrate.

The Examiner respectfully disagrees with this argument. Saito et al teaches that a flat plate having a plurality of holes 34 alternately with holes 35 (as shown in Fig. 14) is provided at the boundary between the activating chamber 31 and the reaction chamber 1a to ensure uniform supply of both gases to the substrate 5. The plurality of holes 34 are for introducing easy to activate gas into the reaction chamber 1a and the holes 35 are for introducing the pre-activated gas into the reaction chamber 1a from the activating chamber 31 (See column 16, lines 15-30). Obviously, the easy to activate gas flowing from the holes 34 and the pre-activated gas flowing from the holes 35 form a **mixture** in the reaction chamber 1a before depositing on the substrate since the holes 34 and 35 are alternately distributed in the flat plate, and since gases expand to fill any volume due to their very nature. Thus, it is reasonable to assume that both activated precursor

gases would be combined before depositing on the substrate, as required by Claim 1. In fact, one of ordinary skill in the art would easily recognize that it would be practically impossible not mix gases flowing from holes 34 and 35 before depositing on a substrate without employing special separating techniques.

Appellants submit that Yamada is completely silent with regard to pulsed plasma formation. Otto only describes a method to adjust layer gradients with high precision even for very thin layers (e.g., col. 2, lines 33-37). The method consists in a plasma power being applied in a pulsed manner and in a layer gradient being adjusted in the direction of the layer growth by changing the plasma power parameters of: pulsed amplitude, pulse width and/or pulse interval (e.g., col. 2, lines 39-44).

The Examiner respectfully disagrees with this argument. First of all, it is well settled that patents are relevant as prior art for all they contain. "The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain." In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) (quoting In re Lemelson, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968)). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. See MPEP 2123 [R-5], I.

Otto et al is applied here for the description of plasma pulse CVD methods **known in the art** (i.e. not for the description of Otto's own invention) including a method described in the article of Kersten et al entitled "Thick Coatings of Doped Synthetic Silica Glass by Plasma Impulse CVD" published in the journal of the Ceramic Society of Japan 99 (10), pages 894 to 902 (**1991**). In these (known) methods, the electromagnetic radiation which excites the plasma is

supplied in a pulsed manner for continuous flow of the coating gases. With each pulse, a thin layer (typically approximately 1 nm) is deposited on the substrate. Even substrates which are not stable to temperature can be deposited during a pulse of high power because a pulse interval follows each power pulse. In this way, especially high coating rates are possible without significant temperature loading of the substrate. See column 2, lines 44-58.

Thus, Otto describes the use of pulsed plasma to avoid damage of heat-sensitive substrates during plasma deposition without limiting heat-sensitive substrates or coatings. Therefore, the skilled person would have an incentive to use the pulsed plasma system in plasma deposition of any coating on any heat-sensitive substrate, including plasma deposition of hybrid coating on a heat-sensitive polycarbonate substrate of Yamada to provide the desired high coating rates without significant temperature loading of the substrate.

Since Otto is applied by the Examiner for the description of plasma pulse CVD methods known in the art **prior** to Otto's own invention (i.e. not for the description of Otto's own invention), the description of Otto's own invention relating to adjusting layer gradients with high precision even for very thin layers at col. 2, lines 33-37 is completely irrelevant to the question of patentability of the claimed invention over Otto.

Moreover, in addition to Otto, the Examiner cited US 6465057 to **Nakahigashi et al** in the Advisory Action mailed on 9/29/2010 as another evidence showing that it was known in the art that pulsed plasma assisted CVD (See column 4, lines 35-43; column 12, lines 7-17) allowed to conduct coating heat-sensitive substrates such as organic thermosetting resin, thermoplastic resin, rubber, paper, wood or the like (See column 7, lines 1-5) at low temperature such as **$25^0$C** (See column 14, line 58).

Appellants submit that the presently claimed subject matter would not have been rendered obvious by the combination of the cited references. As an initial matter the combination of Yamada and Saito with Otto is not the presently claimed invention because it does not disclose all of the claimed limitations. As discussed above, none of the cited references, either alone or in combination describes inorganic and organic components being activated and combined before being deposited on the substrate Further, Yamada teaches a recording layer consisting of an optically reversible material which can turn from an amorphous phase into a crystalline phase and vice versa, depending upon whether the information is recorded or erased. Because of these specific characteristics, the parameters of gas pressure, electric power applied, discharging time and the temperature of the substrate are kept at a particular range value during the formation of the film. As set forth above, Saito discloses a method to prepare uniform films of high quality. It is settled law that the prior art must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention. Accordingly, Otto cannot be considered only with regard to the pulsed plasma, but rather with regard to the preparation of layer gradients as well. However, Yamada and Saito cannot be modified and redesigned, because the combination with Otto would lead to the formation of layer gradients and thus this modification would change the basic principle under which both Yamada and Saito were intended to operate. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Thus, because the proposed modification of the teachings of Yamada and Saito would change their principle of operation, i.e., the principle of operation of the inventions being modified, the teachings of the combination of Yamada and Saito with Otto cannot render the claims prima facie obvious. The combination of the teachings of Yamada and Saito with Otto would not produce a more desirable product so as to justify a motivation to combine their teachings. On the contrary, a person of ordinary skills would have not have reasonable expectation of success that the methods described by Yamada and Saito would be successful or at least would improve if modified to incorporate the pulsed plasma described by Otto. Accordingly, without a reasonable expectation of success, a prior art cannot be modified or combined to reject claims as prima facie obvious.

The Examiner respectfully disagrees with this argument. First of all, as discussed above, Yamada's teaching of a recording layer consisting of an optically reversible material which can

turn from an amorphous phase into a crystalline phase and vice versa, and Otto's teaching of pulsed plasma with regard to the preparation of layer gradients are **totally irrelevant** to the question of patentability of claimed invention.

Second, the combination of Yamada and Saito with Otto renders the claims prima facie obvious because, as discussed above, the combination meets all three basic criteria for establishing prima facie obviousness:

(i) There is clear motivation in the references themselves to modify Yamada with Saito to achieve high speed deposition when using precursors that require different density level of plasma, and there is clear motivation in the references themselves to modify Yamada/Saito with Otto to avoid damage to the heat-sensitive substrate of Yamada;

(ii) There is a reasonable expectation of success in combining Yamada and Saito with Otto since all references are related to plasma assisted chemical deposition processes, and a primary reference of Yamada does not limit its teaching to particular plasma deposition techniques;

(iii) The references when combined teach or suggest all the claim limitations.

Appellants submit that on page 3 of the Final Office Action the Examiner refers to the article "Kersten et al" cited on col. 2, lines 45-58 of Otto ("In these methods, the electromagnetic radiation which excites the plasma is supplied in a pulsed manner for continuous flow of the coating gases. With each pulse, a thin layer is deposited on the substrate. Even substrates which are not stable to temperature can be deposited during a pulse of high power because a pulse interval follows each power pulse. In this way, especially high coating rates are possible without significant temperature loading of the substrate"). The Examiner has interpreted the above-

paragraph as saying that Otto does not teach that pulsed plasma was known to be limited to particular applications to achieve high coating rates and that it is irrelevant that Otto teaches that pulsed plasma may be used for producing the gradient layer (e.g., page 3-4 of the Final Office Action). This is incorrect. First, Otto teaches pulsed plasma methods applied to the preparation of gradient layer and nowhere does it describe that the method can be applied to anything else. Second, Kersten is not used as a reference on which to base a prima facie case of obviousness. Only the statement reported in the "Summary of the Invention" of Otto can be used for allegedly rejecting the claims, and nothing in that statement suggests that Otto teaches that pulsed plasma may be used to achieve something different from gradient layers. Moreover, a person skilled in the art would not be able to use the teaching of Kersten to render obvious the presently claimed subject matter. At best, a person of ordinary skill could try to combine the teachings of Yamada and Saito with the disclosure of Otto. However, as discussed above, and in contrast with the Examiner's assertion, Otto does not provide the skilled person with an incentive to use the pulsed plasma system in the method of Yamada and Saito. The references simply do not provide the motivation to do so.

The Examiner respectfully disagrees with this argument. As discussed above, it is well settled that patents are relevant as prior art for all they contain such that the use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned, and they are part of the literature of the art, relevant for all they contain. For this reason, in contrast to Applicants' assertion, it is entirely correct for the Examiner not to use Otto's own invention of using pulsed plasma for producing the gradient layer as relevant prior art. Further, it is also correct to reject claims based on the text of Otto at col. 2, lines 45-58 describing known prior art methods, without reciting Kersten in the ground of rejection since the text mentions a method of Kersten as one example among many known prior art plasma pulse CVD methods, and thus, not Kersten alone but all known prior art plasma pulse CVD methods constitute the ground of the rejection based on Otto.

Otto describes the use of pulsed plasma to avoid damage to heat-sensitive substrates during plasma deposition without limiting heat-sensitive substrates or coatings. Therefore, Otto does provide the skilled person with an incentive to use the pulsed plasma system in plasma deposition of any coating on any heat-sensitive substrate, including plasma deposition of hybrid coating on a heat-sensitive polycarbonate substrate of Yamada to avoid any damage of the substrate from plasma deposition heat.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Elena Tsoy Lightfoot /

Primary Examiner, Art Unit 1715

Conferees:

/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1715

/Michael Barr/

Supervisory Patent Examiner, Art Unit 1711